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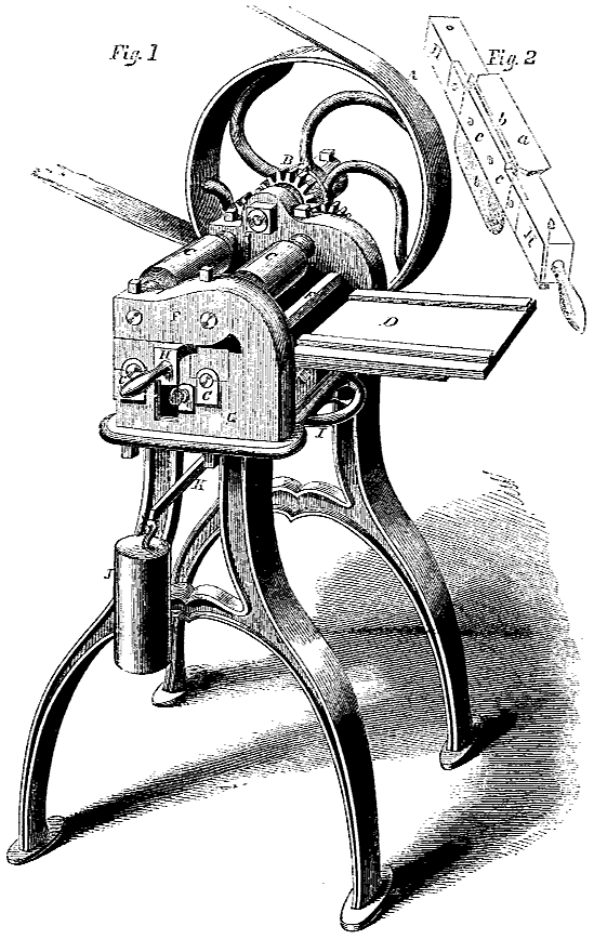
Ship Canal.

Captain Paulding, who was sent out by our government to examine into the feasibility of a canal across the Isthmus of Darien, has recently made a report (to the Navy Department) which appears to be highly favorable to the enterprise. The only serious difficulty in the way of its accomplishment is the climate, as it affects labor. So far as the isthmus itself is concerned, no serious obstacle to engineering skill seems to present itself. The whole extent from the Atlantic to the Pacific Ocean is made up of swamps, hills, and plains, and the highest point of land where the railroad passes is no more than two hundred and eighty-six feet above the level of the sea. On the whole route, most, if not all, the hills through which the canal would pass, would be required for embankments over the plains and swamps. The length from shore to shore is 45¾ miles. The prism of water is to be 150 feet wide at the bottom, 270 feet wide at the surface, and 31 feet deep; the locks to be 400 feet in clear length of chamber, and 90 feet in clear width. The summit level will be 150 feet above mean tide of the Atlantic and Pacific Oceans. The summit cut will be about four miles long. The deepest cutting on this level will be 136 feet, and the average depth of the cut will be 49 feet. The river Chagres yields an ample supply of water for the canal at all seasons of the year. The summit level will be supplied by a feeder about 24 miles long, which will tap the river Chagres about 21 miles above the town of Cruces, where the level of the river is about 185 feet above mean tide, and about 35 feet above the summit level. The cost of this canal, including the requisite harbor improvements at each end, will not exceed $80,000,000. The bays on each side of the isthmus will afford ample room for the commerce of America and Europe.

Work.

There is a perennial nobleness and even sacredness in work. Were he never so benighted, forgetful of his high calling, there is always hope in a man that actually and earnestly works; in idleness alone there is perpetual dispair. Work, ever so mammonish or mean, is in communication with nature; the real desire to get work done will itself lead one more and more to truth, to nature's appointments and regulations, which are truth. Consider how, even in the meanest sort of labor, the whole soul of man is composed into a kind of real harmony the instant he sets himself at work. Doubt, desire, sorrow, remorse, indignation, despair itself, all these, like hell-dogs, lie beleaguering the soul of the poor day worker, as of every man; but he bends himself with free valor against his task, and all these are stilled, all these shrink murmuring far off into their caves. Blessed is he who has found his work; let him ask no other blessedness.—*Carlyle.*

WHITNEY'S PLANING MACHINE.



This planing machine, or, as the inventor calls it, "a machine for smoothing wood surfaces," is quite unlike any of the ordinary planers; the cutting edge being quite stationary and the wood alone moving, and it will smooth wood from one-thirty-second of an inch thick up to almost any size desired. It does not cut in the ordinary sense of the word, but slices off the shavings, and will so slice them until the plank or other piece of wood is perfectly smooth.

Fig. 1 is a perspective view of the machine, which is compact and simple. A is the band wheel that receives the power, and by the aid of the gearing, B, drives four rollers, C, two upper and two lower, the axles of the latter only being seen. These rollers feed the wood to the planer, and also convey it away. D is the feed-board, and F' a piece under which the wood slides, and it is connected with both sides of the upper part of the frame, F, in which the upper rollers run, the lower half of the frame, G, carries the planer, H, and lower rollers whose axle-boxes are supported on india rubber springs, so that they can yield to any slight alteration in the thickness of the wood. I is a wheel having its axle made in the form of a screw, by turning which the upper frame, F, and two upper rollers can be raised to accommodate different thicknesses of plank. J is a heavy weight suspended on a lever, K, on the shorter arm of which is a pivot pressing against the bottom of the cutter stock thus keeping it against the stuff to be planed, and allowing it to move to any inequality in the surface of the wood.

Fig. 2 is a view of the planer, in which *a* is a projecting piece of steel serving as a guide to the stuff, and *b* the plane; this plane is made of hardened steel, and after being ground in the ordinary manner, the edge is turned over in the direction that it meets the wood by a burnisher. It is fastened into H by the screw plate, *c*. Over H, and attached to the frame, F, is a piece of steel, the same width as the plane, and under it the wood moves; it serves to keep the stuff in contact with the shaver, and also prevents it curling up when on the plane.

One of these planers is on exhibition at the Crystal Palace during the Fair. The invention was patented Aug. 11, 1857, by Baxter D. Whitney, and for further information address him at Winchendon, Mass.

British Ingenuity.

English statesmen understand much better than our own the value of the Inventor and the Engineer to the progress of the arms, commerce, and manufactures of a nation. A glance at the record of patents granted by the British government, during the past year, affords a convenient opportunity for estimating the drift of inventive genius in Great Britain. While there are 68 patents for fire-arms, 41 for improvement in gun carriages, and 11 for gunpowder and other explosive compounds, there are no less than 73 for steam engines, 52 for boilers for steam engines, 71 for improvements in the construction of railroads and locomotives, 53 for marine engines, and 77 for arrangements for consuming or preventing smoke in all descriptions of furnaces. The inventions and improvements relative to textile manufactures were exceedingly numerous, as also those of looms, and machinery for producing them. For soaps there were 21 patents, 33 for land and water conveyance, and 34 for pipes, tiles, and bricks, 36 for writing instruments, 38 for paper and pasteboard, 46 for lithography, and 54 for novel arrangements of motive power, or power to be obtained from new sources. In the manufacture of iron, 120 patents were taken out.

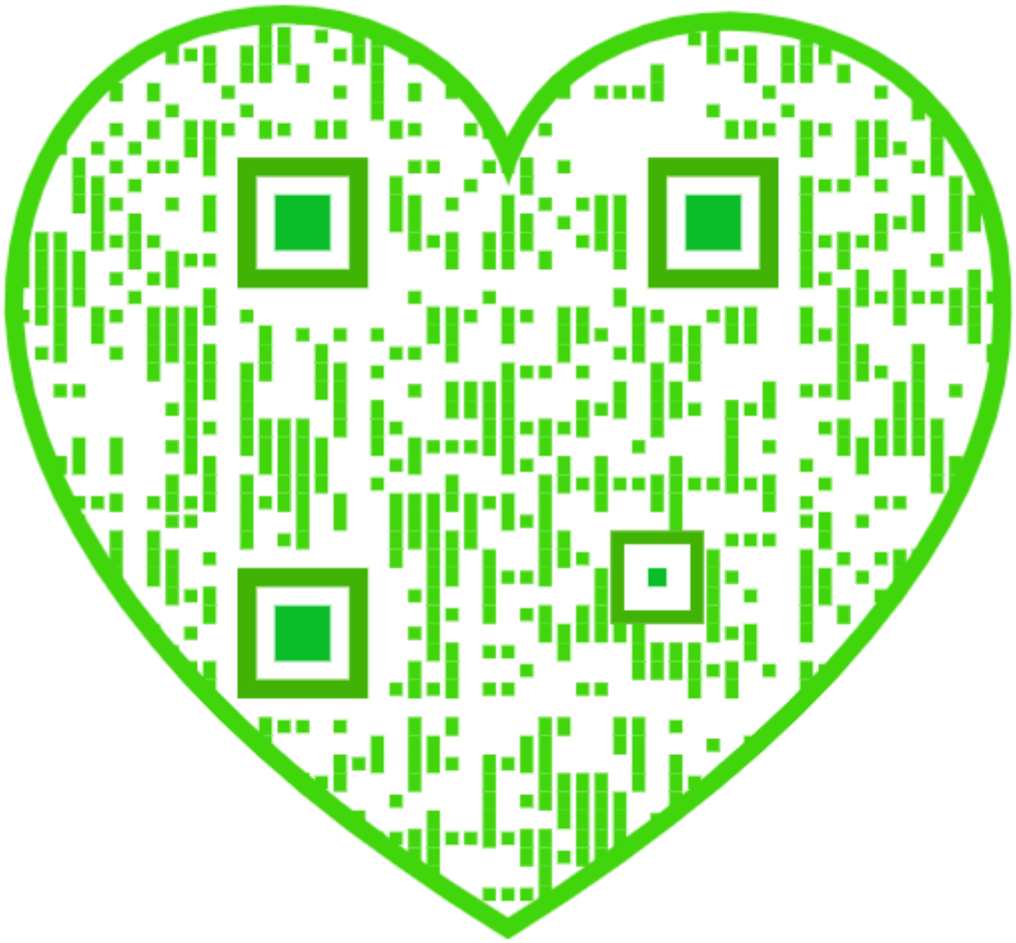
Fire-proof Wood.

The French are a curious people in more ways than one; and among the various channels through which they gain renown is by their startling discoveries. M. Carteren, a French chemist, is reported to have discovered a chemical agent, in the shape of a new salt, which, by being mixed with paint and laid on a plank, renders it fire-proof. An experiment has been made at Neuilly, where a small theatre was built of wood, which had had this salt applied to it. The boxes on the inside and the scenery had also been painted with it. In order to render the experiment more conclusive, the wood was sprinkled over with spirits of turpentine. A light was applied, and the whole place was soon in a blaze and burnt furiously, but when the flames had gone out, it was found that not a single part to which the invention had been applied was in the slightest way injured.

This is, probably, the last we shall ever hear of Carteren's discovery; and we are inclined to think, that it is either a salt of zinc or alumina, and if so, it is only a new adaptation of a known fact, and not the discovery of a new salt.

Coating the Bottoms of Ships.

It is proposed to substitute for the composition now in use for protecting ships' bottoms, a peculiar compound, of which soap is the principal ingredient. For this purpose, an earthy soap is prepared, by making an alkaline soap in the ordinary way, from a caustic lye, fatty matter, and resin. When this is finished, the spent lyes are drawn off from the soap pan, and into the pan is pumped as much solution of lime at about thirty degrees as will decompose the alkaline soap. This earthy soap is transferred to an iron pan with a fire beneath, where it is heated until the whole of the water is separated. There is then added from fifteen to twenty pounds of oxyd of copper, previously dissolved in about forty pounds of resin to each hundred weight of earthy soap, and these are well boiled together. In applying this composition as a coating to the bottoms of ships, it is heated, mixed with some fatty matter or oil, and laid on with a brush. —*Exchange.*



Patent Claims

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 27, 1851.

[*Reported officially for the Scientific American.*]

FURNACES—Thomas and John Aldridge, of Hudson, N. J. : We do not claim, generally, either the construction of smoke-consuming furnaces, as they are called, or returning the smoke, gases, &c., of the fire, back to, or under, the fire or furnace, many differently arranged plans having been devised and used for such purpose.

Nor do we claim the mingling of atmospheric air with the products of combustion, as this has been effected, to a greater or less degree, by many inventions.

But we claim the combination and arrangement of the smoke and gas conductor, F, the atmospheric air tube, H, and the blower, G, arranged and located substantially as and upon the principles declared, and for the uses and purposes set forth and described.

We also claim the connection with such arrangement of the smoke conductor, F, and air tube, H, regulating the velocity of the blower, G, by, and according to, the pressure of the steam in the boiler, through the intervention of the conical pulleys, or their equivalent, substantially as and for the purposes set forth and described.

SEEDING MACHINES—Horace R. Allen, of Nelsonville, Ohio : I claim the cleaners, s, constructed as described, with the projections, v, working in the groove, w, and operated by the motion of the slide, H, as and for the purpose set forth.

FEATHER DRESSING MACHINE—Amon Bailey, of East Poultney, Vt. : I do not claim dressing feathers by steam.

I am aware that various methods have before been adopted, with more or less success; but none, so far as I can learn, in which the steam has been distributed and controlled in the manner I employ.

I claim the combination of the steam chamber, H, with the radial tubes, F, horizontal tubes G, and valves E, all constructed and operating substantially as described.

RAILWAYS—Sidney A. Beers, of Brooklyn, N. Y. : I do not claim the several parts or devices separately, as set forth, but in combination.

But I claim the construction of a continuous iron rail of successive sections of upright arches, the upper surface of which shall form a plane, and held in position by upright iron ties, with tenon and wedge or keys on the outside, and surmounted and bound together by a wrought iron rail, which last mentioned rail is held in place by hooks and key wedges, or their equivalents, as set forth.

SOWING SEED BROADCAST—Jacob Boyers and David S. Greer, of Grantville, Va. : We are aware that spirally grooved or fluted cylinders have been placed under seed hoppers to act as distributors; this we do not claim, as they are inefficient, and the seed too readily flies off by any jar of the machine.

But we claim, in combination with a seed hopper, and encased, spirally flanged roller or axle, which receives, carries around, and delivers the grain in uniform quantities at the edge of the receiving board, without being affected by the jar of the machine in passing over the ground, as set forth.

BRUSHING RICE—Oliver I. Butts, of Georgetown, S. C. : I claim the application of a flat brush for brushing rice, consisting of a flat runner dressed with sheep skins and bands in connection with a wire bed, constructed and operating as described.

BUTTER WORKERS—Ebenezer Butler, of Pompey, N. Y., and George M. Peck, of Abington, Pa. : We claim the arrangement of the crank, B, plunger, C, the partition, D, and scraper, E, to work in combination, as described, in the process of working butter.

METALLIC SCREW CAPS FOR JARS, &c—John K. Chase, of New York City : I claim a screw cap for bottles, jars, or cans, &c., formed out of a single solid plate of metal, by spinning the same over a threaded chuck or former, as specified, and for the purposes set forth.

NUT MACHINE—Richard H. Cole, of St. Louis, Mo. : I claim the preliminary shaping of the end of a heated metallic bar, to make it correspond on all sides, save one, with the cross section of the finishing die box, by which the necessity of cutting off, by the punch, of more than one side of the nut to be formed, is prevented, and from which results a very great saving of metal in manufacturing many-sided nuts at the same time that a considerable saving of power is produced in operating the machine; but this I only claim when the said preliminary shaping of the exterior portion of a nut is accomplished immediately in front of the mouth of a die box, substantially in the manner set forth.

CANE UMBRELLAS—Heman Crosby, Jr., of Waterbury, Conn. : I claim an improved cane umbrella, constructed in manner and so as to operate substantially as described, that is to say, as made so that the joint ring or collar of the ribs may slide on the rod, and the stretchers applied to the rod, and the whole made so as to be capable of being drawn out of a tubular staff or cane, unfolded, or spread out, reversed, folded, and returned within the staff, as occasion may require.

BREAKING COAL—John R. Dellun and Jasper Snell, of Pottsville, Pa. : We claim the inclined curved grate bars, C, constructed as described, in combination with knives or dividers, E, on segments, a, placed spirally on shaft D, operating as described, and for the purposes set forth.

STEAM COTTON PRESS—T. J. de Yampert, of Mobile, Ala. : I do not claim the toggle levers, d, and cross levers, Q Q, separately, or in themselves considered, for they have been previously used and applied in various ways to presses.

Nor do I claim, broadly, the application of steam power to presses as a motor for presses; an example may be seen in S. G. Cabbells' and A. Scdy's rejected application, 1851.

Nor do I claim, broadly, the union of the upper and lower platens of presses, by means of toggle links; an example may be seen in Aaron Hale's patent, June 26, 1832.

But I claim the arrangement and combination of four piston rods, F H N K, which unitedly operate the followers of the press, with a central axis, R, and cross levers, Q d located within the steam chest, C, as described.

[A notice will be found on another page.]

FRUIT GATHERERS—William Doty, of South Hartford, N. Y. : I am aware that screens and troughs have been used in various ways for screening articles and conveying them to the proper receptacles, and I therefore do not claim, broadly, inclined screens and troughs separately and irrespective of the arrangement shown.

But I claim the combination of the apron B, stretched or placed over the frame, A, the screen, D, formed of the adjustable and stationary wires, e e, and the inclined troughs F G', the whole being arranged as shown for the purpose specified.

[This is described on another page.]

SEVERING EARS OF CORN FROM THE STALKS—A. J. & J. A. French, of Franklin, Vt. : We are aware that endless aprons are commonly used as feeding devices, and also that two cylinders, D E, (one being provided with knives,) are in common use for cutting stalks, &c. ; but we are not aware that the apron and cylinders have been combined so as to operate conjointly, as shown, for the purpose specified.

We claim the endless apron, B, and pressure roller, C, in combination with the cylinders, D E, the cylinder D being provided with knives, d, and the cylinder, E, having a smooth periphery, the parts being arranged as described, for the purpose set forth.

[For information about this machine we refer to page 67.]

ROTARY SHEARS—Anson Hardy, of Boston, Mass., and George A. Rollins, of Manlius, N. H. : We are aware that rotary shears have been used in connection with rotating clamps for cutting sheets into disks; this we do not claim.

But we claim the particular arrangement of the shears, carriage, clamps and stops, for cutting metals, as set forth.

WATER WHEEL—William Henley, of New Salem, N. C. : I am aware that the shafts of water wheels have been passed through cylinders, and that a top vent wheel has been devised; these I do not claim, independent of each other, or of the manner in which I arrange them with the curb and water way.

But I claim so arranging a wheel on the top of a curb that has an open center, and the water way of which diminishes from its bottom towards the point where it meets the buckets of the wheel, so that the points of the buckets shall project into and be struck by the live water, and the whole wheel lifted up to counteract the weight of the dead or back water, as set forth.

CORN PLANTERS—Hanford Ingraham, of Naples, N. Y. : I do not claim any of the described parts separately, or irrespective of their arrangement.

But I claim the arrangement of the seed hoppers, S S, in connection with the hollow teeth, f f, the valves, n n, agitating wires, w w, the vibrating springs, v v, for the purpose and in the manner substantially as set forth.

SEWING MACHINES—John W. March, of Oxford, Mass.: I do not claim the use of a slide for a feed motion irrespective of its form and accompaniments.

But I claim, first, the combination of the slide, A, provided with the slots, C D, guard, E, and pad, H, with the foot piece M, with its guide, N, and slots, arranged, and operating substantially as described.

I also claim the combination of the slide, A, and foot piece M, with the knife and needle holder, as constructed and arranged for securing and trimming the work while being sewed, in its passage through the machine.

GRINDING AND POLISHING MACHINE—Daniel Lovejoy, and George F. Butterfield, of Lowell, Mass. : We claim giving the plate, B, or other article to be ground, a vertical reciprocating motion tangentially with the plane of motion of the stone or wheel, D, or parallel therewith, and also a vibrating lateral motion, for the purpose set forth.

[See notice of this grinding and polishing machine on another page.]

MOWING MACHINES—John P. Manny, of Rockford, Ill. : I claim suspending, elevating and lowering the cutter bar of mowing machines in a horizontal position by means of flexible connections, such as cords or chains, attached to each of its ends, when the same are arranged in relation to, and used in combination with, independent rigid frames, substantially in the manner and for the purposes described.

PRINTING MACHINE—Samuel W. Francis, of New York City : I claim, in combination with a series of keys, a series of stop bolts, P Q P' Q', constructed and arranged in the manner specified, whereby the simultaneous action of two or more keys, and consequently of two or more hammers, is effectually obviated.

I also claim connecting with the type hammer, x, a secondary hammer or counter-weight, h, by means of a spring and rod, e, substantially in the manner described, for the purpose of actuating with greater ease, and of maintaining the equilibrium of the type hammer in its various positions.

I also claim the combination of spring power mechanism with the "paper car," when the former is made to propel said car in a direction contrary to the lines to be printed, and when the car is guided in its course by rails, substantially as described.

I also claim the specific device described for holding the paper flush with the inking band, consisting of the roller, l, connected to the frame, A, by a system of parallel link frames, and holding the paper with gentle pressure upon and against the roller, h', substantially as set forth.

In combination with the roller, l. I claim the spider wheel, when arranged in relation and operating in connection with the lever and spring, so as to feed the paper in a direction perpendicular to that of the printed line.

I also claim the combination of the movable frame with catch, spike wheel, and pawl, when so constructed and arranged as described, whereby the car is made to move by the action of keys during the intervals of printing, substantially as set forth.

SHINGLE MACHINE—Simeon Marshall, of Philadelphia, Pa. : First, I claim the slots, y y y y, in the driving plate, with the peculiar formed arms, f f, combined and connected substantially as and for the purpose specified.

Second, I claim the general arrangement of parts operating in the manner described and for the purposes set forth.

MAKING IRON SPOONS—G. I. Mix, of Wallingford, Conn. : I claim having the rivet or pin which secures the handle and bowl of the spoon together, formed on the handle at the same time, and of the same piece of metal, by the same die which gives form to the handle, whereby an improved article of manufacture is provided, to wit, an iron spoon with the rivet forming part and parcel of the handle, substantially as and for the purposes set forth.

[These spoons, when finished, are equal in looks to German silver, and are for superior to them in strength and utility.]

FASTENING FOR METALLIC BANDS FOR COTTON BALES, &c.—William Minor, of Houma, La. : I claim securing the ends of metal hale hoops together by forming loops or eyes in the ends of said hoops by cutting parallel slits, b, through them, and bending outward the intervening portions, b', the loops overlapping each other as the ends of the hoops are overlapped, and a transverse wedge or key, c, passed through the loops, substantially as shown and described.

[By means of a die two eyes are cut in the hoop, and when brought together, a pin is hammered through them, thus forming a strong and efficient fastening.]

RAILROAD CAR SPRINGS—Henry M. Paine, of Worcester, Mass. : I claim the combination of the disks with the hollow tie bar A, nuts B B, and metallic plates C C, substantially as specified and set forth.

OPERATING RAILROAD BRAKE—Philander Perry, of Troy, N. Y. : I claim the use of the sets of nuts and screws, arranged upon the under side of the car body, worked by the hand wheel and chain, and operating upon the pairs of brake rubbers as described, for the purpose specified.

I also claim arranging springs, E, between the bottom of the car body and the brake rubbers, as described, so as to prevent jolting or jarring of the car body while its weight presses the brake rubbers upon the top of the car wheels, and also to facilitate the application of the brake rubbers, as specified.

WASHING MACHINE—Thomas J. Price, of Industry, Ill. : I claim the stationary frame, B, and adjustable frame, D, placed within the box, A, and provided with vibrating slats, a, operated substantially as shown for the purpose specified.

[By means of two frames—one fixed and the other adjustable—in the washing box, and provided with horizontal vibrating slats, the clothes are subjected to sufficient rubbing to cleanse them.]

MAKING IRON SPOONS—Russel B. Perkins, of Meriden, Conn. : I claim as my improvement in the manufacture of spoons, forming the bowl with the tongue, a', and the end of the handle with a cavity fitted to receive said tongue, and then attaching the same together, substantially in the manner set forth.

RAILROAD CHAIR—John S. Robinson, Levi Herendeen and George Sheldon, of Canandaigua, N. Y. : We do not claim as our invention the application of a key to a chair to deaden the sound, &c.

Nor do we claim placing the spike holes so that the spikes will catch in the notches in the rails.

But we claim the placing of the spike holes nearly, or directly, under the key, so that the spike heads can come in contact with it and the spikes themselves pass through the notches in the rails, if desired, and thus causing the key to hold the spikes from working up, and also in the manner described, causing the spikes to prevent the key from working out

CULTIVATORS—Thomas A. Robertson, of Friendship, Md. : I am aware that a weeding implement was patented November 18, 1851, to Henry Goldson, in which a scraper or mold-board was attached to the standard of a plow in such way as to turn the weeds over the land side of the plow; and therefore I lay no claim to such an invention.

But I claim the curved scraper in combination with the plow point and standard, in such manner that the weeds and seeds shall be delivered in the rear of the standard, as set forth.

REVERSING THE CHISEL IN MORTISING MACHINES—C. B. Rogers, of Norwich, Conn. : I claim the application of the sliding check pin, F, and the check guide, J, and the spiral reversing guide, B, to the objects and for the purposes set forth.

SEWING MACHINES—S. H. Roper, of Roxbury, Mass. : I claim, first, The feeding of the cloth alternately in opposite directions, for the purposes specified, and in the way described, or in any equivalent manner.

Second, I claim the use of the two plates, o e, for the purpose of giving uniformity to the length of the stitches by preventing the wearing of the lever, g, as described.

Third, I do not claim the hook, r, for the purpose of taking the thread through the cloth, as has before been used; but I claim the yielding force of the hook, r, which will allow said hook to remain stationary if the thread does not readily pass through the cloth until the needle is withdrawn as described.

Fourth, I do not claim the double-hooked needle or the use of it in taking the thread both ways through the cloth; but I claim the combination of the double-hooked needle, and the hook, r, for the purpose specified, all substantially as described.

BEE HIVES—B. D. Sanders, of Holliday's Cove, Va. : I claim, first, The combination and arrangement of the outer casing, A, with the extended sides, a a, and vertical bottomless honey boxes, E E, with the grooved and peculiarly perforated internal moth traps, F F, substantially as and for the purposes set forth.

Second, The combination and arrangement of two honey boxes, so as to produce a double chambered swarm hive, when constructed and arranged in relation to each other, and to the outer casing, A, substantially as shown in Figs. 1, 5 and 6, and for the purposes set forth.

[This improvement provides for a gradual enlargement of the area of the hive on a continuous horizontal plane, and thus the necessity of piling the boxes on top of each other is avoided, facility for cleansing the hive is afforded, and the bees are induced to work harmoniously in a swarm hive which is divided by a glass partition into two chambers; and thus, if one chamber becomes infected with moths, the other will remain uninfected, and the infected section can be removed without disturbing the other.]

SEED PLANTERS—J. D. Smith, of Lancaster, O. : I claim the use in combination with a planter to be propelled by hand of the arrangement consisting of the double-acting valves, F G, compound lever, G, H, g, h, i, double-chambered hopper, B F, adjustable pitman, I, and swiveling self-adjusting roller, D, the whole being arranged and combined substantially as set forth.

[This invention insures the planting of the corn in hills, at regular distances apart, and affords facilities for planting in drills when desirable. It plants a hill of corn at each half vibration of the slide, and cuts up all obstructions such as weeds and stubble in its progress, making the way clear for the deposit of the seed into the soil. If the surface of the ground is irregular, it accommodates itself to the undulations.]

COTTON SCRAPERS—J. G. Winger, of Vicksburg, Miss.: I do not claim broadly the constructions of hoe scrapers for acting on both sides of the ridge at a single operation.

But I claim the longitudinally adjustable cutters, C C, having each an inclined vertical and curved portion as described, in combination with mold board, supports and frame, substantially as set forth.

STEAM PRESSURE GAGES—E. G. Allen, of Boston, Mass., assignor to H. O. Allen, of Malden, Mass. : I claim the volute spring as described, when of uniform width and thickness from its center to its circumference, in combination with a disk of rubber or other elastic material, substantially in the manner and for the purpose specified.

HAND PRINTING PRESSES—Jedediah Morse, of Canton, Mass., assignor to the Ruggles Power Press Manufacturing Company, of Boston, Mass. : I do not claim the combination of one or more cam plates, K M, a cam lever, L, and one or two sets of rollers or their equivalents, arranged between the said cam lever and cam plates, as I am aware that such mechanism for operating a platen is not new.

Nor do I claim arranging the platen spring on the top of the arch or frame of the press, and applying it to a bolt and other devices for lifting a platen as shown or used in the well-known Albion press invented by Cope. I so arrange the rod, F, depending from the spring, G, as to cause it to pass through the lever, pitman, and other mechanism for depressing the platen, the same serving not only to support the whole in place, but as a fulcrum for the lever to work on.

I am aware that the foot of the lower toggle of a press has been attached to the toggle by a screw, whereby the impression could be adjusted.

I claim arranging the lifter rod, F, with respect to its spring, G, the screw, f, lever, L, the pitman, I, and cam plates, N N, substantially in the manner, and so as to operate therewith as described.

I also claim the arrangement of the regulating wedge on the lifter rod, and between the depressing mechanism, and the crown of the arch, substantially as described.

MAKING BRUSHES—L. A. Tripp, of New York City, assignor to L. C. Platt, of Westchester county, N. Y. : I claim, first, the use of the slot, H, or equivalent device for, in the connecting rod, G, in combination with the needle for causing it to remain stationary at each end of the stroke of the crank a, definite space of time, for the purposes before set forth.

Second, I also claim the use of the sliding bar, R, having a bracket, S, attached thereto, in combination with gripers, T, operated by the devices before described or equivalents therefor, for the purposes substantially as set forth.

Third, I also claim the loop former, W, operated by means substantially as described, in combination with the needle for the purposes before set forth.

CULTIVATORS—Nicholas Whitehall, (assignor to himself and A. L. Whitehall,) of Rob Roy, Ind. : I claim providing a double cultivator, the middle of which is elevated to pass over the corn, with a compound evener suspended upon three points, and arranged as described for the purpose set forth.

MACHINERY FOR SPINNING FLAX AND HEMP—M. D. Whipple, of Charlestown, Mass., assignor to Alfred B. Ely, of Newton, Mass. : I claim, first, The device employed for regulating the amount of fibre drawn from the hank by the size of the yarn, consisting essentially of the lever, a, 2, and screw or stop, b 2, attached to the draw nipper, 8, with its immediate connections, and the hook disk, z 1, operating in the manner substantially as set forth.

Second, I claim the vibrating draft nippers operating in the manner substantially as set forth, whereby the twist is allowed to run up.

Third, I claim the vibrating hanker-holder, U, constructed and operating substantially as described.

Fourth, I claim the inclined wires or teeth on the guide pulleys, O R, operating in the manner and for the purpose substantially as set forth.

RE-ISSUE.

LOCOMOTIVE LAMP—I. A Williams, of Utica, N. Y. : I claim, first, Constructing the cap, B, with several compartments, in communication with each other, substantially as and for the purpose specified.

Second, The combination of the perforated inverted cone, b, cap, f, funnel, d, and perforated tube, c, constructed, arranged and operating as before set forth, for admitting air to the can, and prevent the slopping of oil from the vent.

Artificial Crystals.

The metals are frequently obtained in the crystallized state by fusion. If a few pounds of bismuth be melted in a crucible, and then allowed to cool until a pellicle of solid metal begins to form on the surface, crystals may be obtained by piercing this crust and allowing the still liquid portion in the center to flow out. On breaking the shell which remains after this operation, it will be found to be lined with beautiful crystals of bismuth belonging to the cubic system. Lead, when heated in large masses, and slowly cooled, also deposits crystals, and on this circumstance is founded one of the more recent improvements in the refining of that metal.

Many volatile salts and other bodies may be obtained in a crystalline state by sublimation. In this way calomel, corrosive sublimate, camphor, iodine, benzoic acid, napthaline, and a vast variety of other substances, are crystallized and purified at the same time from the non-volatile substances with which they may be contaminated.

Lignin.

This is the woody fibre of plants. It shows itself in a variety of forms, constituting the different textures of hard and soft wood, and various fibrous products, such as hemp, flax, cotton, &c. When, by fine mechanical division, it is reduced to a pulpy state, it is formed into paper. Lignin is very imperishable, but under certain circumstances it is attacked with the *dry rot*, arising from the growth of a parasitic fungus, which causes its rapid decay. Damp timber, in places where air has not free access, is particularly subject to its attacks, and even the well-seasoned timber, in the neighborhood is extremely liable to the same disease. The dry rot may be prevented by impregnating the timber with certain saline solutions, and of these a solution of corrosive sublimate has been found most effectual.

Cure for Stammering.

At every syllable pronounced, tap at the same time with the finger. By so doing the most inveterate stammerer will be surprised to find he can pronounce quite fluently, and by long and constant practice, he will pronounce perfectly well. This may be explained in two ways, either by a sympathetic consentaneous action of the nerves of voluntary motion in the finger, and in those of the tongue, which is the most probable; or it may be that the movement of the finger distracts the attention of the individual from his speech, and allows a free action of the nerves concerned in articulation.

Errata.

ANDREWS' CENTRIFUGAL PUMP.—In our engraving and description of this pump in No. 7 of the present volume, there is an omission which we now correct. By referring to Fig. 3, it will be found that the tops of the fans, *l*, are flush with the top of the rotating piston. This shape would give a great pressure on the piston, and prove a defect in the machine. In those now constructed, and on which part of the patent is based, there is to each fan, *l*, a little inverted V-shaped projection above the surface of the piston, and this by creating a circulatory movement in the water relieves the pressure on the piston, L.

The Crisis in its Bearing upon the Progress of Improvement.

The effect of the present financial revulsion upon almost every branch of industry has been severe in the extreme, and will, probably, be seriously felt during the greater part of the ensuing winter. Its effect has been not only to reduce the means for prosecuting business operations, but it has also much weakened the confidence which men have had in the various transactions in which money was supposed to be almost sure to be made by attentive industry and perseverance. Such a result is not very strange. When we see about us men who have done a straight-forward, legitimate business for ten, twenty, thirty, or forty years—men who have labored early and late through a long period of time to build up a fortune on what they deemed a secure foundation—men, too, of ability, integrity, and tact—when we see such men as these in every branch of trade *go down in scores like grass before the scythe*, it cannot be considered very singular that men should soberly and seriously question the absolute security of any and every investment whatever. Uncertainty seems to be stamped upon every kind of financial transaction; all are involved in the same common ruin together, and it is hard to say which, if any, are least damaged by the crash. The effect of all this will be that capitalists will now look about them to see—not what investment is absolutely secure—but in what way the smallest amount of money can be made most productive.

The branches of trade in which capitalists have generally been most ready to invest have been those which were slow in their return, and in which small sums were not largely productive, their choice being evidently governed rather by the supposed smallness of the risk than the greatness of the gain. We have said that a different policy is likely to obtain, for the reason that the insecurity of all investments has become painfully apparent; but there is also another reason, namely, that the changes of the times have reduced in most cases the funds of those who have been engaged in business which required investments. Under such circumstances, smaller outlays *must* be made available, for the conclusive reason that the larger cannot be made. What is then more likely to meet this public want than the many and varied mechanical improvements of the age? As a whole, they probably pay better than any other investment; but they have been avoided by capitalists on account of uncertainty in the results of the outlay. This reason *now* loses much of its force from the fact that we have found all other branches of business open to the same objections. This field is sufficiently large to employ to advantage all the capital and attention which are likely, in any contingency, to be bestowed upon it. It is a field which has, up to the present time, been only superficially worked; but is, nevertheless, one which, if properly cultivated, will produce an abundant harvest. A small investment judiciously made in a promising invention, and backed by such tact and iron energy as any one who may hope, in these perilous times, to succeed in any enterprise must expect to exhibit, would enable many a man to retrieve his fallen fortunes, and again place himself on the list of wealthy and prosperous men.

[We copy the above article from a recent number of *Life Illustrated*; and it is worthy the serious consideration of a large number of our readers. While the factories and shops of our manufacturers and mechanics are stopped for the want of orders for their products, it behooves them to look about, and see if they cannot employ their steam or water power in the manufacture of some new and useful fabric or machine, the advantages of which, in days of prosperity, they had not time to consider. There are no lack of substances they might make, or experiments that might be tried, and instead of a loss, the crisis would be a gain. Now is the time to develop inventive genius, and to experiment upon, and put into operation, inventions which are already patented.

A Public Benefactor.

Samuel W. Adkisson, Esq., of Tennessee, sends us a copy of a letter addressed to the General Assembly of that State, in which he expresses thanks for the confidence placed in him, for having passed his bills into laws—some of them without alteration; and as he wishes "to wind up his business for fear it may wind up him," he proposes to loan to the State Library seven different works on Political Economy, Banking, Finance, etc. It is certainly a very commendable spirit in troublous times like these, to shed all possible light on finance and kindred subjects, but what most interests us is his devotion to the various moral and secular pursuits of the day. He says he has "tunneled a mountain; cut down hills; raised valleys; made smooth and easy roads over steep and rugged places; dammed and bridged creeks and rivers; made steam and streams drive the wheels to do the work of thousands; bought and cleared land; caused grass, grain and fruit to grow where they did not; aided my younger sisters and others to get homes; assisted in building and keeping up *churches*, schools, *ball-rooms*, printing presses, tan yards, iron works, mills, *distilleries*, stores, shops and other things; given work, nourishment, comfort, ease and amusement to many;—at the same time I have sustained many losses; had bad health myself, and a sickly wife; have spent one half my time and money in traveling and with doctors; have not made more than three per cent. on work done and money spent under charters, nor cleared three per cent. on money lent;—all which I did with my own capital and skill, and I think my credit is as good as some others more favored."

[We must certainly regard Mr. A. as an unparalleled benefactor—one who deserves well of his country.—EDS.

New System of Notation.

A correspondent writes to us from California, proposing a new method of counting, &c. He commences by finding fault with the present decimal system, because it is not capable of division down to unity; and proposes an octave system, whereby units shall be divided into eighths instead of tenths, as being the more easy, because it is capable of a natural division and multiplication from and to unity. The successive halves of 100 are 50, 25, 12½, 6¼, 3⅛, 1 9-16th; whereas the octave representation of 100, or 64, may be halved thus: 32, 16, 8, 4, 2, and 1; no fractional parts are necessary, each half being a pure whole number. He further proposes to use the ordinary numerals up to 7, then he will symbolize eights by *10*, *20*, and so on, sixty-fours by *100*, *200*, &c., and fractions by *06*, *07*, &c. This is decidedly novel, and very plausible. As to our correspondent's argument, that it would do away with much fractional work, we quite agree with him; but with him, also, we are afraid the world will not easily adopt it; at any rate, we think it is well worthy of attention, so we have published it for the criticism of our readers.

The Light of the Moon.

As the moon's axis is nearly perpendicular to the plane of the ecliptic, she can scarcely have any change of seasons. But, what is still more remarkable, one half of the moon has no darkness at all, while the other half has two weeks of light and two of darkness alternately; the inhabitants, if any, of the first half, bask constantly in earthshine, without seeing the sun, whilst those of the second never see the earth at all. For the earth reflects the light of the sun to the moon in the same manner as the moon does to the earth; therefore at the time of conjunction, or new moon, her further side must be enlightened by the sun and the nearer half by the earth; and at the opposition or full moon, one half of her will be enlightened by the sun, but the other half will be in total darkness. To the lunarians the earth seems the largest orb in the universe; for it appears to them more than three times the size of the sun, and thirteen times greater than the moon does to us—exhibiting similar phases to herself, but in a reverse order; for when the moon is full, the earth is invisible to them, and when the moon is new, they will see the earth full. The face of the moon appears to us permanent, but to them the earth presents very different appearances, the Pacific and Atlantic oceans, in the course of each twenty-four hours, successively rivet their attention. The moon being the fiftieth part of the bulk of our globe, and within 238,000 miles of us, may be brought by a proper telescope which magnifies 1000 times, to appear as she would to the naked eye were she only 250 miles off.—*Exchange*.

Important Railroad Decision.

Judge McLean, of Cincinnati, O., on motion to appoint a receiver for the New Albany and Salem Railroad, has just decided that a receiver need not be appointed simply because there was a default in the payment of interest upon the bonds of the company. The law abhors a forfeiture, and would never enforce one.

The fact that the company had paid all the net earnings (saving the usual surplus) to liquidate its floating debt, did not justify the court in holding that this was a misapplication of the earnings, for, if that debt was contracted to finish the road, or to relay the track, then it was beneficial to the bondholders and all concerned. The court would not take the road out of the hands of the present managers, for it was apparent that they had managed the road with fidelity and integrity. The court then made an order, directing that in future the net earnings of the road should be applied in equal proportions to the payment of the floating debt and the interest upon bonds.

What makes Dough Rise?

The cause of the rising is the vinous fermentation produced by the spontaneous change of the gluten or albumen, which acts upon the sugar, breaking it up into alcohol and carbonic acid gas. If the fermentation is regular and equal, the kneading and intermixture thorough, and the dough kept sufficiently and uniformly warm, the production of gas will take place evenly throughout the dough, so that the bread, when cut, will exhibit numberless minute cavities or pores, equally distributed throughout. For its capability of being raised, dough depends upon the elastic and extensible properties of its gluten, which is developed by the admixture of water with flour. Hence the proper quantity of water is that which imparts to the gluten the greatest tenacity—an excess of it lowering the adhesiveness of the glutinous particles. The toughness of the gluten prevents the small bubbles of gas from uniting into larger ones, or from rising to the surface. Being caught the instant they are produced, and expanding in the exact spot where they are generated, they swell or raise the dough. All rising of bread depends upon this principle—the liberation of a gas evenly throughout the glutinous dough. No matter what the mode of fermentation, or what the substances or agents employed instead of it, they all bring about the result in the same way.

Salphurium.

Mr. Joseph Jones, of England, announces that he has discovered the perfect metal sulphurium, which is of the same class as arsenium, silver, aluminum, &c. Oxyd of sulphurium is the refuse of the manufacture of sulphuric acid, or brimstone, and has no commercial value, persons being paid for carting it away. In its refuse condition it has almost the specific gravity of iron, and the atoms are very fine, malleable, ductile, &c.

Population of New South Wales.

This oldest Australian possession of Great Britain contains, according to the census of 1856, a population of 266,189 souls; but making an allowance for births, deaths and immigration since it was taken, it must now be nearly 300,000. Of these, 42½ per cent are native Australians, 55 per cent were born in the United Kingdoms, and of the rest, Germany furnished the greatest number.

Beer Drinking.

The greatest lager beer drinking city on the globe is, undoubtedly, the city of Munich, in Bavaria, where revolutions are caused by the slightest rise in the price of beer. On the 1st ult., there were in the different vaults 28,769 Eimers (about 521,880 gallons) of winter-brewed beer, the "genuine lager;" and 393,580 Eimers (7,139,541 gallons,) a total of 7,661,421 gallons. The quantity brewed this season exceeds that of the previous one by 42,739 Eimers. Twenty-three brewers have manufactured this enormous quantity of beer, which will just suffice to supply the 130,000 inhabitants of Munich for 180 days.

Age of Oil Painting.

The art of oil painting was originated in 1410, (thirty years before the invention of printing by Guttenburg,) by John Van Eyck, a native of the low countries or Flanders, when he was forty years of age. He taught it to Antonello of Messina, an Italian, who was the founder of the Italian school. One of the first, if not the very first, of oil paintings, is still preserved in the cathedral of Ghent, Belgium, where it is regarded as a most precious relic.

Modification of Wood Bearings.

The bearing for shafts for screw propellers adopted lately by an eminent English engineer, is to surround the shafts with casings of brass, the inner surface of which are grooved so as to receive fillets of wood. Through the spaces formed between the fillets, water is allowed to flow freely between the shaft and the bearing, keeping the whole cool, and acting as a lubricator. Another modification of the invention is to fix the wooden fillets on the shaft, which then rotate with it in the brass bearings.

Fruit Harvester.

When apples and similar fruit are intended for winter use, if shaken off the tree they are damaged by the fall, and will not keep, and to gather them by hand involves a great amount of labor. An inventor—W. Doty, of South Hartford, N. Y.,—has devised an arrangement for the purpose of gathering such fruit expeditiously. It consists of an inclined apron attached to a frame, and by means of inclined spouts and other devices, the fruit is conveyed into suitable receptacles.

Cotton Press.

T. J. de Yampert, of Mobile, Ala., has invented a new cotton press, which consists of four pistons and cylinders operating levers on the toggle principle, placed in a steam chest, and thus obtaining the whole force of the steam. These levers all move on a central axis, and bring together the two platens between which the cotton is placed.

Grinding and Polishing Metal Plates.

D. Lovejoy and G. F. Butterfield, of Lowell, Mass., have invented a new machine for effecting this purpose, whereby the plate to be polished is given a reciprocating vertical movement, in a plane tangential with the grinding stone or wheel, and at the same time a lateral vibrating movement, by which motions the plate is perfectly ground.

Cutting Corn from Stalks.

By means of an endless apron and pressure roller, for feeding, and a cylinder provided with knives and pressure roller, for cutting, the corn may be cut from the stalks and the stalks cut up for fodder in one operation. It is the invention of A. J. & J. A. French, of Franklin, Vt.

Mountains.

There is nothing on the surface of the earth which adds so much to the grandeur of scenery or the beauty of a country as its mountains; and nothing is so miserable and dreary as a flat and level plain, until made attractive and interesting by association and the hand of man. But in natural or wild scenery, it is the mountains that are picturesque and beautiful.

New Inventions.

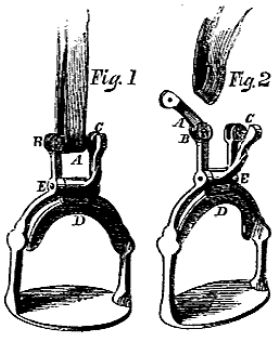
Flour.

A French chemist is said to have discovered a cheap and practicable method of disintegrating wheat and other grain by chemical instead of mechanical means, so as to produce fine and admirable flour without a mill of any kind. A commission has, it is stated in a late French paper, been appointed to examine the nature of the flour chemically, so as to ascertain its character, as compared with flour which has been produced by crushing and grinding.

Neil's Safety Stirrup.

Many persons practising horse exercise have found the inconvenience and danger of a rigid stirrup, for on being thrown (as the best riders sometimes are) should the foot catch, and the rider not be able to disengage it, he is in great danger of losing his life from being dragged along the ground, head downwards. The subject of our engraving is a device for overcoming this danger. Fig. 1 exhibits the improved stirrup attached to the stirrup-leather, and Fig. 2 shows the same when it is freeing itself from its attachment. The invention is very simple in construction.

The lever or extension piece, D D, which projects slightly in front, works on a pin at the joints, E E. The operation of the stirrup is this: If a rider is thrown, and the foot remains fastened, any part of the foot which



presses against this piece, D, will operate as a lever, and draw out the steel pin, C, and this liberates one end of the bar, A, which works freely at the joint, B, as seen at Fig. 2, and the stirrup will remain on the foot as both are freed from the saddle. This ingenious invention was patented Sept. 22, 1857.

For further information and particulars, apply to the inventor and patentee, James Neil, Yorkville, N. Y.

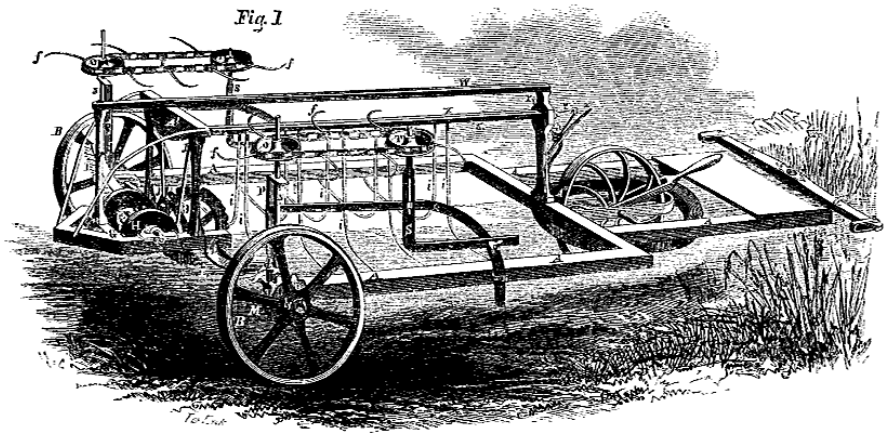
Improvement in Harvesters.

The invention we are about to describe is an improved harvester for indian corn or maize, possessing many advantages over the various modifications of machines for the same purpose now in use. It will be understood by reference to the engravings, of which Fig. 1 is a perspective view of the whole, and Fig. 2 a front view, with the front projection removed, to show the working parts. Similar letters of reference indicate like parts in each.

A represents the frame, and *a a*, the shaft to which the horses are attached. The front end of the frame is supported by two wheels, B B, and the axle, C, which extends across the frame, connecting the wheels, B B. The wheels, B B, are attached to the axle, C, by a pawl and ratchet, *b*, so that when the machine is moved forward, the axle will rotate, and when moved backward it will be stationary. On the axle, C, is secured a toothed wheel, D, which gears into a pinion, E, placed on a shaft, F, fitting into a projecting frame, G, attached to the front end of the main frame, A. On the shaft, F, is fitted a cam, H, which may be described as a wheel set obliquely on the shaft F, as shown. I I represent two cutters which are formed of two steel plates or strips curved in segment form, and having triangular teeth; the inner ends of these cutters are attached to the rods, J J, whose upper ends are pivoted to a cross piece, A′, which is placed on the top of *a′*, attached to the frame G. The inner ends of the cutters are fastened to a horizontal arm, K, the outer end of which is pivoted to the front end of G, and between two friction rollers on K, (Fig. 2,) the cams, H, work. Directly over the cutters I I, stationary fingers or teeth, L, are placed, and are of the same shape as I I. These teeth are securely attached to the frames A and G. On each end of the axle, C, a bevel toothed wheel, M, is placed. These wheels gear into the pinions *d d*, which are attached to the lower ends of the vertical shafts, N N, one on each side of the frame. On the upper ends of N N, a pulley O, is fixed, and the bearings of these shafts are attached to bars, P P, the lower ends of which are placed loosely on the axle C. To these bars, P, are attached the curved bars, Q Q, which fit on a socket, R, on A, and from these rise the bars S, carrying another pulley, T, and around the pulleys O, T, endless bands or chains, U, work; these chains having curved teeth, *f, f*, projecting from them. V is an upright fixed

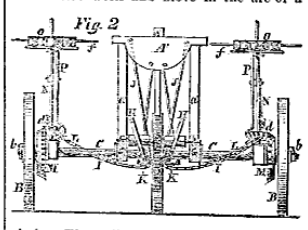
HOWARTH'S IMPROVED HARVESTER.

Fig. 1



to the back part of A, and W is a horizontal piece connecting N with A′, and to the upper end of an upright, *g*, fixed in the frame G. X X represent two shafts, which are fitted at one end in bearings in the upright, V, the opposite ends being fixed into A′. The ends of X X near V have each an arm, Y, attached, and the ends of these arms are connected by links, *h*, to a lever, Z, the lower end of which is fastened by a pivot to A. To each shaft, X, a series of arms, *i*, are attached, and these extend to the sides of A. The back part of the frame is supported by a swivel wheel, A″.

The operation is as follows:—As the machine is drawn along, a reciprocating motion is given to the cutters, I I, in consequence of the cam, H, revolving between the rollers, K. The cutters work and move in the arc of a



circle. The stalks, as the machine is moved, are deflected from the center of the machine towards the cutters by the angular shape of the fore part of G, and are forced to the cutters by means of the arms, *f*, on the endless chain, U, the chains being driven by the gearing, M *d*. The cut stalks fall down upon the arms, *i*; and when sufficient stalks have been cut to form a sheaf or gavel, the shafts, X X, are turned by the driver, who operates the lever, Z, thereby throwing the arms, *i*, towards each other, and lets the stalks fall on the ground. The great advantage of this machine is, that the teeth being curved, they work with greater ease and certainty than the straight ones, and have a better cutting edge.

This harvester was patented July 21, 1857, by Mr. G. D. Howarth, of Decatur, Ill., from whom any further information and particulars may be obtained.

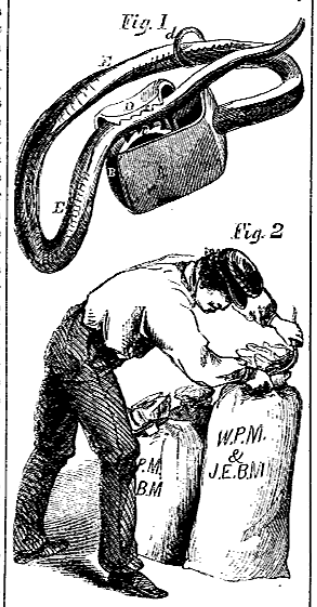
Economical Steam Generation.

There have been put in use in this city and immediate vicinity within a few months past, over a score of steam boilers, which, by a novel arrangement, invented by Messrs. T. & J. Aldridge, of Bergen, N. J., generate steam with an extraordinary degree of economy. A patent for the invention has just been issued, and will be found in our list of claims this week. The boilers used belong to any of the common varieties, the novelty consisting not in the increase of the heating surface, nor in any peculiar arrangement of the parts of the boiler proper, but in adding flues and a blower exterior to the whole. The temperature in the furnace and flues is raised by feeding the fire with hot instead of cold air, and the movement of the air through the grates and flues being strong and certain, a very inferior quality of fuel may be employed; so that the new device economises in two ways: first, by requiring an absolutely less quantum of coal, and second, by allowing of its use in less expensive form, such as chestnut size coal, fine dust, dirty or refuse coal, &c. We hope to be able to illustrate this invention in a few weeks, when its merits will be more fully discussed.

Maxson's Bag Fastener.

This is an ingenious and simple contrivance for fastening grain and other bags, and entirely avoids the necessity of tying. It secures them in a most perfect manner, are easily adjusted, and can be used a great number of times. Our engravings illustrate in Fig. 1, the fastener, and in Fig. 2 the method of using it.

In Fig. 1, A is a metal box, shown the actual size. B is a piece turned over on itself, so as to form a spring, and having on its edge a number of teeth cut, *c*, as also has the piece D, which is part of the box. The whole is cut out of one piece of metal, and it is only



bent together, having no joints to become unfastened or rivets to become loose. E is a leather strap, which is fastened by one end to the box, (as seen at *e*,) and having on it a ring, *d*, through which the end passes when tightened around the sack.

The operation is very simple: The strap is placed around the neck of the bag, and the end passed between the teeth, *c*, and pulled quite tight—the elasticity of the spring allowing it to be pulled in that direction. When tight, the teeth press into it, and prevent its becoming loose. In Fig. 2 a person is seen using it; and it is removed by slipping it out from between the teeth, which can only be done by hand.

This bag fastener was patented September 1, 1857. For further particulars and information address the inventors, W. P. and J. E. B. Maxson, of Alfred Center, N. Y., or G. W. Maxson, Tonawanda, N. Y.

Specie Safe.

A correspondent suggests that all ships carrying specie or treasure, in any shape or form, should be provided with a water-tight safe, in which all valuables should be put. This safe ought to be made of boiler iron, globe-shaped, well painted, and lined inside for six inches with cork, and having a lining of thinner iron inside the cork if requisite; a small water-tight door would be all the entrance required, and the safe could be made of any size. By means of two handles it should be tied to the deck, and might have the ship's name embossed upon it, so that in case of wreck or a catastrophe like that of the *Central America*, it would only be necessary to loosen the safe, and it would float away and be picked up by the crew of some vessel, who might return it to its proper owners. This is a suggestion worthy of attention, although we think it will prove practically inoperative.

Scientific American.

NEW YORK, NOVEMBER 7, 1857.

The Literature of Science.

It is an extraordinary fact, and yet a common-place one, that true science is scarcely ever disseminated among what are called "the masses," viz., those who make up the bulk of our population. We have colleges, schools, and literature for the education and improvement of the people, but of their general value, or, rather, the width of their scope, we can only say that it is lamentably small. For present consideration we shall only take the literature.

We may conveniently divide scientific literature into two broad divisions: books and newspapers, or periodicals. Of the former there are many treating of every science, and going deeply into the hidden mysteries of nature, but the only reliable ones are those written by men of high repute and good education; these are, unfortunately, the very men who are most liable to fall into the great error of long and hard words—it is not done intentionally, but from the habit which they have acquired of using technical expressions and Latin names for common things. Another drawback to these books is their price, which is always high, from the fact that they are only expected to have a limited circulation. Now we ask our readers what chance has an ordinary man, who really wants information on some subject, of obtaining it from the best and only reliable books? His education is simply reading and writing, and then, perchance, he had to study nature while picking stones off a farm; and obtained his knowledge of chemistry while errand-boy to a druggist. His college has been the workshop; his desk the plow, the anvil, or the loom; his study, the noisy yard full of men enjoying their hours' relaxation from labor. What time, we ask, has he to conquer hard words, and learn a new tongue? None at all; and if the desired information is not to be obtained in his own way, he will have to do without it. Again, it is true that there are innumerable cartloads of books written on "popular science;" but we would as soon recommend a man to drink at a pool of dirty water as to seek information from them. It is true they contain science, but it is very bad; as it is true the pool contains water, but who would drink it if they knew there was a clear, bubbling, running stream within a mile or two? There are, of course, many good ones, and they are noble exceptions to the general rule—for general rule it is, that popular science is too popular to be good.

We must look, then, to the newspapers and periodicals of the day (the current literature of the hour) for all the information that is wanted by the unlearned, but ingenious. Let us for a moment see how the newspapers fulfil this duty. In nearly every State we find at least one periodical devoted to agriculture, and another to education. Nearly every weekly newspaper has a column of selected or original matter, called "art, science and inventions," or "science and mechanic arts." The dailies, in their turn, occasionally give a scientific article, and are always ready to afford any information in their power in the "answers to correspondents"—usually the most interesting column of a newspaper. These are the means at command for spreading science, in all its phases, among the people; add to these, ourselves (of whom we do not say too much when we state that the SCIENTIFIC AMERICAN is the most popular of all teachers throughout the United States and Canada), and a few minor papers devoted to special interests in commerce or arts. Small as this account may seem, to combat with the ignorance still existing, yet it is powerful and intelligent, and will, in time, conquer; so that "knowledge shall cover the earth as the waters cover the sea!"

Confessions and Reforms in Railroad Management.

Hitherto there seems to have been no concert of action among the various railway interests of the country, and, as a natural result, each company has carried on its operations almost entirely on its own hook. For the want of that harmony so essential to success, a spirit of competition sprang up, and has been carried on in a manner disgraceful to the management and ruinous to the interests of shareholders. We are glad to announce a return towards common sense and common honesty, and that in future, on points of policy and expenditure, there is likely to be some unanimity of action.

At a late meeting in Cleveland, O., numerously attended by representatives of the leading roads, it was resolved to discontinue the nuisance of employing runners or agents for the passenger business, or the allowance of compensation, drawback, or commission for procuring passengers. It was also determined to increase on all rates of freight, and that the rates be made uniform between competing points by all lines. The "free ticket" system is to be abolished, except to employes and persons or agents traveling in the regular service of the company, and for strictly charitable purposes. No company is permitted to issue any bill or poster except one stating truly the distances, connections, rates of fare, &c.; and all *injurious references* to competing roads are to be excluded therefrom. Any road used in common by two or more competing routes is to be managed impartially. The rates of passenger fare on competing lines to all common points, are to be uniform, and can be reduced only by consent of all the members of the convention.

It appears from the above points, condensed from the resolutions passed by the convention, that the various competing companies will hereafter publish no more lies in regard to distances run by other roads, and will discontinue the practice of trying to ruin each other by injurious references. In other words, the "Peter Funk" system, hitherto confessedly a part of the policy of some of our railroad companies, will be discontinued on and after this date. This certainly points to a glorious future; and if these regulations are adhered to, they will, no doubt, have a beneficial effect on the finances of all the main lines of railroad.

Death of Crawford the Sculptor.

Thomas Crawford, the American sculptor, a native of this city, died in London on the 10th ult., aged 44 years. A gap has been left in the artistic society of Rome in which he moved that will not easily be filled. He was a rare artist, but though the hand is cold in death, the marble it cut is still among us, and his works will live to keep his memory green.

His ideal busts, of which "Sappho" and "Vesta" are good examples, are models of purity and grace. Some of his other more celebrated works are the "Genius of Mirth," "Adam and Eve," "David, as the Conqueror of Goliah," "David before Saul" (a bas relief), "The Shepherds and Wise Men presenting their offerings to the Saviour" (a bas relief containing twenty-four figures), "Christ Disputing with the Doctors" (a bas relief containing twelve figures), Christ and the Woman of Samaria" (a bas relief), "Christ blessing Little Children," "Christ ascending from the Tomb," "Christ raising Jairus's Daughter" (all bas reliefs), "Prayer," &c. The execution of his bas reliefs is delicate and spirited, and the religious subjects, especially those in which the person of the Saviour is introduced, are marked by singular propriety and dignity of treatment.

His genius, however, was eminently progressive, and his crowning works were destined to come last, In 1855 his noble statue in bronze of Beethoven, confessedly the only one yet designed which is worthy of the subject, or which gives an adequate idea of the original, was received in Boston, and deposited in the Music Hall of that city with appropriate solemnities. With his last great work, the Washington monument, ordered by the State of Virginia, comprising a bronze equestrian statue of Washington on a lofty pedestal, with statues of Henry, Jefferson, and other illustrious Virginians surrounding its base, the public have long been familiar from numerous published descriptions.

The statue of Washington, now on its way to this country, has elicited flattering encomiums from all who have seen it, including some of the most distinguished art-critics of Europe, and is doubtless one of the most successful works of its kind of modern times. It is of colossal size, and was cast in the celebrated foundry in Munich, under the personal superintendence of the artist. The accompanying statues have been designed, but not all executed.

Crawford was a noble representative of American genius in the art-world of Rome; and we fear it will be long before we find another who can so ably represent us in that city of the beautiful, the gorgeous, the grand!

The Indian Mutiny.

All the world is looking with interest and anxiety to the battle-field of India, and every one is speculating on the probable results of the rebellion. Questions are daily asked, "What was the origin of the mutiny?" "Is it a fight of caste or religion?" We will attempt to answer the inquiry by giving a short account of the commencement of the insurrection.

There are many castes in India, who, like the Jews, will not eat pork, and any one doing so at once loses caste, that is, his friends will not eat with him or speak to him, and he is regarded as an abandoned character and an outcast. Thus with the Hindoo to lose caste is a serious misfortune, and which every one of them carefully avoids. Now for the mutiny. On the 22d of July last, Lieut. Wright, at Dum Dum, informed his commanding officer that a report had spread among the troops to the effect that the paper of the cartridges of the Enfield rifles were greased with pork fat, and therefore to bite them was to lose caste. We quote an anecdote from his letter:

"The belief in this report has been strengthened by the behavior of a classie attached to the magazine, who asked a sepoy of the 2d Grenadiers to supply him with water from his lota. The sepoy refused, observing he was not aware of what caste the man was; the classie immediately rejoined, 'You will soon lose your caste, as ere long you will have to bite cartridges covered with the fat of pigs and cows,' or words to that effect. Major Bontein then called the attention of the Commander-in-chief to it by a temperate and sensible letter, requesting him to allow the men to buy the grease themselves and grease their own cartridges, so that they might know there was no fat used which their religious prejudice prevented them from tasting."

The following order was then issued from Calcutta to the army: "In order to remove the objection the sepoys may raise to the grease used for the cartridges of the rifle muskets, all cartridges are to be issued free from grease, and the sepoys are to be allowed to apply, with their own hands, whatever mixture suited for the purpose they may prefer."

The day after the date of this, and we may fairly suppose before it had become generally known, a sergeant's bungalow (or house) was set on fire at Runegunge by one of the same 2d Grenadiers, other incendiary fires followed, and it is the embers from the ruins of this house, helped by pig's fat and Hindoo prejudice, which have set India blazing with such fearful strength that it will take Great Britain some years to thoroughly overcome the power of the flames.

The Children's Aid Society of New York offers to act as the agent of charitable people who will pay for the transportation of the thousands of unemployed girls in the city to the West, where their services are needed, and where living wages are offered to them. This is the most effective and substantial charity.

Results of Calculation.

There are many persons who cannot, or will not, appreciate the harmony and beauty of natural laws, the reason being, we suppose, that they are incapable of following the calculations necessary for their elucidation, and thus, by avoiding all the trouble, the result brings no pleasure to them. Where can anything more beautiful be found, and in what fact can you find a greater demonstration of the harmony of the universe, than that the same law which governs the motion of the planets, also controls a falling stone? The same force which binds the rocks together also keeps in contact the particles of skin on our hands. The universe and all things in it obey a system or code of laws which cannot be broken. It may appear extraordinary when we state that there is nothing violent or irregular in nature! The upheaved rocks of former ages have all been upheaved gradually, and in obedience to a controlling power; even apparently capricious earthquakes always move and ever will progress in a definite and given path around the globe; and the eruption of a volcano can be calculated to a nicety. Storms can be prognosticated, hurricanes predicted, and a comet's appearance prophesied; all these wonders are the result of hard and dry figures, the consequence of great calculation. Who, in future, will not have a great respect for arithmetic?

Steam Power versus Wind.

Under favorable circumstances the wind is sometimes a better locomotor than steam. A late passage of the ship *Lord Raglan*, from England to India, with troops, is a good illustration. This vessel, propelled only by canvas, made the passage to Bombay in twelve days less time than the royal mail steamer. The season was the most favorable for prosperous breezes. In the fall of the year it is said that the winds are contrary, and that the steamers can go in half the time occupied by the fleetest sailing vessels.

Perhaps the fastest sailing ever obtained is upon the ice. The construction of ice-boats—a couple of planks, skates, a sail and rudder—is familiar to all. These frail contrivances are sometimes driven by the wind at a speed of thirty miles an hour. We heard of a trial of speed between one of these ice-boats, on the Hudson river, and a train of cars running on the adjoining track. In a race of twelve miles the cars, with all steam on, succeeded in getting ahea only twice their length.

Those who are unaccustomed to the management of iceboats sometimes receive practical lessons while learning. When under quick speed, the slightest wrong guidance of the rudder diverts the boat with tremendous violence, and hurls out the occupants like a ball from a cannon.

Go Ye and Do Likewise!

A friend in the interior of Pennsylvania, after becoming a subscriber, was so well pleased with the SCIENTIFIC AMERICAN, that he went at once and induced a neighbor to take it also. We rely upon just such friends as these to aid us in keeping up its circulation; and we now earnestly call upon them to use *extra* exertion to send in new subscribers. We hope our friends will not forget their favorite paper, even in these pinching times. We believe no better investment can be made with the same amount of money. The SCIENTIFIC AMERICAN is a great economiser in the workshop and family, and should be carefully read during hard times. Cheer up, friends, and send in your lists of subscribers. If you can't send ten names, send one. If you do not feel able to pay for a year in advance, send fifty cents for three months, or one dollar for six months. In such times as these we do not wish to be too particular; and if we cannot get a whole loaf, we will take a half of one. We appreciate every effort made to extend our circulation. Remember the prizes—$1,500!

By mixing with the world we often imperceptibly lose our prejudices while engaged in analyzing them.

The Twenty-ninth Annual Fair of the American Institute.

SEVENTH WEEK.

The rainy weather has, we are sorry to say, somewhat interfered with the attendance of visitors to the Fair during the seventh week, and the building has therefore not been so crowded as we should have liked to have seen it. No novelties of any importance have been added since our last issue, but everything is in perfect working order, and nearly all the machines are at work, each attracting its circle of interested spectators, who cannot be otherwise than profited by the exhibition.

Before continuing our descriptions, we will speak of the value of Fairs as educators and civilizers. The somewhat erratic yet practical genius of France first taught the world the value of such exhibitions, or as the French say, *expositions*. At first it was simply a collection of all that had been done in some one branch of trade, a lace exposition, a fine art exposition, or a mechanical exposition; samples of the work produced, specimens of machinery used, details of processes employed, designs for new patterns, suggestions for improvements, &c., were received and exhibited. All interested in the manufacture of the fabric, or whatever else it might be, came to criticise and take notes. They saw what others had done in that field, and could compare it with their own productions: they could examine the means used, and observe in what particulars they could improve their own machinery and processes. These expositions engendered an honest rivalry among all classes to try and excel their neighbors, and, in consequence, surely but secretly added to the wealth and intelligence of the country. Then came the regular annual exposition for *all* kinds of things, which was open to the public that they might learn and be enlightened. In these yearly displays of genius, children would be early familiarized with machinery, manufactured productions, pictures and statuary; and they would learn more in one stroll through such an exhibition than they could from a year's study of a whole library of books; older people could here see those things of which they had heard and read: and on the whole, it was found that such annual gatherings made one portion of the community acquainted with the productions of another, and that they stimulated exertion to excel, and created commercial prosperity by encouraging the workers in every branch of trade, science or art.

The practical mind of America, after she had thoroughly settled down into her independent national life, was not long before she appreciated these continental expositions, and called them "Fairs." Various societies and States held them annually, and they have been productive of great good. Perhaps one great cause of the ingenuity of the American people, and why we have always been so apt and quick at mechanical contrivances, is because all that has been done in machinery and allied constructions is, so to speak, continually set before the public; hence, the observer must be instructed per force, even if he be against his will. The climax of these exhibitions was ultimately reached in London, Eng., in 1851, where the concentrated genius of the whole world was represented, and all who entered the "World's Fair" came out wiser and better. Comparatively the same is true of the present Fair at the New York Crystal Palace, and despite the pecuniary pressure or panic, we have no hesitation in saying that America is more enlightened and better informed than she was seven weeks ago; and one of the great agents in this progressive movement has been the subject of this dissertation.

In the South Transept is a large model (or rather a machine of working size) of Frank G. Johnston's "Self-regulating Sails for Windmills;" the rate at which they rotate is controlled on the same principle as the governor of a steam engine, namely, by the tendency which a weight has to fly off at a tangent when subjected to the action of a powerful rotatory force. These sails have been previously noticed in the SCIENTIFIC AMERICAN, page 236, Vol. XI.

Just before the machine above mentioned is a beautiful pleasure sailing boat, owned by Conrad Fox, of Hoboken, N. J. It has a mainsail and jib, is provided with a center-board, and was built on an elegant and safe model by W. L. Force, of Keyport, N. J.

The "Patent Self-rocking Cradles" made by D. Walker & Co., of Newark, N. J., attract a great deal of attention especially from mothers: many of them (the cradles) are fitted with a fanning attachment for use in hot weather and mosquito times: and although they are not very new, their utility entitles them to a notice.

The compact and useful folding clothes-dryers, wash-benches, ironing tables, camp stools, chairs, and bedsteads of Cram & Norris, 105 Maiden Lane, New York, are very ingenious, and occupy but little space. The legs are all constructed on the principle of the letter X, and so are capable of being doubled into a very small space, and by means of hinges they can be folded quite flat. A life-preserving seat that can be folded up and easily carried, also a settee which would hold four persons with ease, and can be so doubled that it may be carried in one hand without inconvenience are exhibited.

Of billiard tables there are three—one from each principal maker in this city. Mr. Phelan exhibits a beautifully inlaid one, with his patent combination cushions, which have made him so celebrated throughout the world. Levi Decker, 20 Ann street, this city, also shows a specimen of his manufacture: and Leonard & Benjamin, of 332 Broadway, exhibit a fine table.

The "West Castleton Slate Co.," No. 370 Broadway, this city, exhibit some mantle-pieces and other articles in slate, and also a large slab, the largest we have ever seen, and of a grain that is fine, hard and compact.

We were glad to learn that the managers of the Fair had determined to keep the Crystal Palace open until the 6th of this month, in order that the Fair might be viewed in all its pristine magnificence by those who had hitherto been prevented from visiting it by the recent deluges of Jupiter Pluvius.

THE LIBRARY.—We would call attention to the advertisement of the American Institute on another page, giving a list of the works recently added, and would honestly recommend it to the practical man as the library for him.

The Steamship Great Eastern.

The progress which has been made within the last four months in the construction of the monster ship at Blackwall, London, is something marvelous; and this rapid advance towards completion is even more wonderful to the practical mind than to the ordinary observer, who cannot comprehend the vast amount of labor which has been expended on this gigantic undertaking.

The visitor, when making his survey of the exterior of the ship will not fail to remark the two paddle-wheels; these, with their sponsons or fenders, are completed, and appear like enormous radiated disks placed at a great hight on the sides of the vessel. He will also observe the huge plate-iron funnels, through which the tallest man could easily walk upright, as they lie in the yard ready for being hoisted on board. Before ascending the turret staircase to the deck he can, without much difficulty, creep beneath the ship's bottom to the water side, where he will find a numerous body of workmen engaged in the construction of that most important and crowning effort of scientific skill, the launching-ways, upon which the gigantic vessel is to be borne to the river.

The massive combination of timbers forming the two platforms, supported by a substructure of piles and concrete, are already finished, and the workmen are now employed fixing down the railway metals upon which the cradles carrying the monster ship (twenty million pounds weight) will glide into the Thames.

Some idea may be formed of the immense exertions that are being made to complete the gigantic hull and its appurtenances, when we state that there are now no fewer than seventeen hundred men continually employed upon it, and that workmen are engaged day and night preparing the timber and iron work for the launching cradles. The cost for wages and salaries to artisans, laborers, and employés in the building-yard has, we understand, reached the large sum of $13,000 for one week.

These extraordinary efforts are necessary in order that the arrangements shall be completed by the 3d of November, on which day, favored by the high spring tides, it has been definitely settled that the launch of the leviathan ship shall take place.

Indian Railways—American Engineers.

The Bombay *Gazette*, in noticing a speech delivered in the British House of Commons at its last session, says:—"If the joint stock operations of England and America were carried on in our ordinary round-about system of routine, the word 'progress' would cease to be known in the commercial vocabulary of those countries." The Bombay *Times* suggests: "The Great Indian Peninsular Railway would have done better to have sent to America for a consulting engineer; yet we question the expediency of that step, for had a thorough, go-ahead Yankee practitioner been placed at the head of the engineers' department, under the Indian system of controlling railway affairs, the tyranny of 'red tape' would assuredly have driven him out of the country, or stark staring mad in a twelvemonth. The more zealous and expeditious an American engineer might be in managing the practical duties of his office, the more keenly sensible would he be of the encumbrances of the existing *régime*, by which he would be compelled to bestow much of his time upon voluminous official correspondence, of which he could not recognize the utility, and from which he would neither derive any relief from responsibility nor assistance in his works."

The above compliments, all the way from India, will be duly appreciated by American engineers.

Pressing Cast Iron.

It is proposed, says the *Pennsylvania*, to refine melted cast iron by means of currents of air in a covered furnace or chamber, without the addition of coal or other fuel. The metal being in a melted state—taken from the blast furnace—is run into a chamber or furnace, closed to such an extent as may be necessary to prevent the temperature of the contents being too much lowered. Air tweers are introduced from a blowing furnace above the level of the melted iron, and in such a position that air shall be blown down with considerable force upon the top of the melted metal, so as to produce a combination of the carbon, combined or mixed with the iron. The blast may be either hot or cold, and the process continued until the iron is brought into a state similar to that called "fining metal," or "refined iron."

Transporting Produce.

For some months past, considerable quantities of farm produce and other perishable substances have been brought to this city from remote parts by means of a new description of rail car, fitted up on the principle of a refrigerator. By this invention an artificial atmosphere is created—pure, dry, and cold. Fresh meats and poultry have been brought from the Western States to New York city during the extreme heat of the summer months—a season when the value and utility of the invention would be subjected to a severe test—with complete success. By one arrival, fifteen hundred turkeys, chickens, geese, &c., and one hundred and eighty carcasses of mutton, were delivered in this city in as good condition as when first placed in the car, in which they had remained nineteen days.

A PROFITABLE BUSINESS.—About the best thing, it would seem, that a man could do in the way of providing for his family, would be to get killed on a railroad, taking pains, however, to choose one which still remains solvent. We observed that a widow in Massachusetts recovered $18,000 damages against the Boston and Worcester Railroad Company, the other day, for having killed her husband.

RETRENCHMENT.—It is reported that the hitherto fashionable ladies of Hartford, Conn., have resolved themselves into a society for retrenchment. They propose to discard silks and satins for a while, and, on the principle that "charity begins at home," will wear only such goods as are made in home mills; hoping thus to stimulate employment for needy operatives.

A MILLION OF SPECIE.—Most of our readers would fancy it an easy matter to count over the large sums of specie frequently spoken of in newspapers. But it would require upwards of two months—usual working hours—for a single individual to count and envelope properly, in small packages, one million of gold dollars. Gold is not counted in large sums now, it is weighed.

POVERTY, OYSTERS AND RUM always go together; so says Dickens, and he is right. The only business which appears not to be affected by the hard times is the rum trade. While the receipts for eating show a general decline, there is, we are informed, a large increase in the amount received for liquors at many of the principal drinking saloons in this city.

SOUTHERN MANUFACTURES.—The Augusta (Ga.) *Chronicle* says that a large number of manufacturers in Georgia have determined upon holding a convention at Atlanta, for the purpose of an interchange of views, and of determining upon the measures best calculated to promote the success of the manufacturing interests of the State and the South generally.

RAILROADS.—We are among those who believe that by economy and judicious management, the railroads in our country can be made to "pay." If directors would manage them as they usually do their own property, the stockholders would get satisfactory dividends.

TRANSFUSION.—It is reported in an English journal that a woman who had suffered from uterine hemorrhage until life was nearly extinct, recovered by transfusing seventeen ounces of blood from the veins of her husband into her arm. A singular case, if true.

THE CHINESE WALL.—Dr. Bowring, in a recent lecture on China, said, speaking of a the great wall, that if all the bricks, stone and masonry of Great Britain were gathered together, they would not furnish enough material for such a structure.

FOSSIL SHELLS.—Some extensive fossil remains of the *Tercdo coraiformis*, recently discovered at Brussels, presented a strong smell of the sea, from which it appeared that the antediluvian oceans had the same smell as those of the present day!

TREMENDOUS TRAFFIC.—The number of passengers conveyed by the "London General Omnibus Company," within the past year, has averaged thirty-seven millions and a half, or at the rate of nearly three-quarters of a million weekly!

SOMETHING ENTIRELY NEW.—It is thought by many that economy will be "fashionable" this winter. The "oldest inhabitant" has never before heard anything like it.

FLOUR.—During the war of 1812, a barrel of flour at Buffalo cost $70, in consequence of the almost impassable roads thither, and the snail-like travel of the horse and wagon line.

Correspondents

E. B. W., of N. C.—There is nothing new in your idea of making axles tubular. They are manufactured in Great Britain, and if we mistake not, there is an agency in this country for their sale. We do not remember to have seen any statement respecting their qualities.

J. P., of La.—If you wish to learn civil engineering, Mahan's treatise is the best condensed work we know of. It is sold by Wiley & Halsted, of this city. Mechanical engineering covers so wide a scope that we do not know of a single publication that embraces all its important features. There are plenty of handbooks, such as Haswell's, Byrne's, and Scribner's, which are good.

J. C. C., of Conn.—By reference to Ure's Dictionary, Vol. I, page 395, you will find the information you desire in regard to vulcanizing india rubber. We are not aware that the *retsinade* of this process has yet been given. All we can say is, that it is a change in the molecular arrangements of the india rubber, due to chemical action and combination; but how this change takes place, and what it really is, no one has yet been able to tell.

A. S., of Miss.—Cast-iron surfaces are hardened by chill casting. The molds are made of iron, which suddenly cools the molten metal by conducting away the heat rapidly, thus producing very hard surfaces on the castings—the best for grinding purposes, with the exception of steel surfaces.

C. C., of Ohio.—We are sorry to hear of your ill-luck. Inventors, by delaying applications for patents, are oftentimes involved in trouble; and for the want of means to appeal their cases, finally lose their rights entirely, because they did not attend promptly to applying for a patent.

J. M. R., of ——.—We do not know that there is any market here for "soft-soap." You had better address your inquiry to Allan Hay & Co., this city.

J. S., of Me.—We cannot give the information you seek in reference to "workingmen's association." We have not heard much of them lately.

E. P. G., of Mass.—There is no penalty for stamping "patent applied for" on inventions for which applications have actually been made. If the case has been withdrawn, the manufacturer must consult his own conscience as to the propriety of continuing the notice.

B. A. L., of Conn.—We are not aware of any acid used to blue gun barrels, although there is a kind of varnish used to preserve them after they have been blued by heat. Sulphuric acid is used to mottle gun barrels brown; but the blue and black appearance can only, so far as we are aware, be brought about by heat. Any blacksmith will thus color a piece of iron for you.

J. K., of Pa.—"Ranlett's Cottage Architect" is a good work: price, $12. Harper & Brothers, this city, published an illustrated volume on cottage architecture, by Vaux; the price, we believe, is $2.

C. E. M., of N. J.—The gas emitted from the salt mill which you describe, must be carburetted hydrogen, as it burns with a bright flame. It is generated by subterraneau heat from some hydro-carbon shale. There is nothing singular about it: at many places in our country the same phenomena can be seen.

R. D. C., of Mo.—If you wish to construct a cistern so that the water may be filtered, use a small box filled with clean sand and gravel, through which the water is allowed to percolate as it enters into the cistern.

J. C. of Pa.—Your idea of admitting air above the fuel to effect the combustion of the gas (carbonic oxyd) is quite an old one. We have been familiar with it for 15 or 16 years, and have seen it introduced in boiler furnaces.

E. S. Holmes, of Lockport, N. Y., wishes to procure hard drawn brass wire suitable for spiral springs.

S. A. S., of Ohio.—The dead points are overcome as you surmise, and the second one is neutralized by the weight which, as you know, swings round from the force acquired in falling, and does not stop when it has performed 135 degrees. There is no doubt that it does what we state; but of the other dead points we can say nothing, as they are not included in the machine.

J. B., of R. I.—Your assignment should be recorded at the Patent Office within three months from the date it was given to you, for some subsequent purchaser might claim the right to the patent by having his assignment previously recorded. You would probably have a cause for action against the party that sold to you, as having committed a fraud, but the second purchaser would hold the patent.

C. C., of N. Y.—Send on your model and patent fee by express, and we will prepare your case without delay. The patent to which you refer has not yet been issued, and we will endeavor to get your case into the office in time to have an interference declared.

George G. Hughes, of Jackson, Tenn., wishes to purchase the best and cheapest machine known for riving staves from the block. He also wishes a saw for cutting up trees in the forest.

W. R., of Texas.—The green mucous substance was of vegetable growth, and would, undoubtedly, act as an agent for supplying the fish with oxygen. Your friend had in his cellar as perfect an aquaria as any that is specially constructed and arranged.

D. M. C., of N. Y.—You inquire how many pounds per minute must fall 25 feet to carry a pair of mill stones of the usual size, at the ordinary speed. Ans.—It will require 10,560 pounds falling 25 feet per minute to drive a pair of 4½ feet mill stones, at 100 or 200 revolutions per minute.

P. H. G., of Conn.—If you would consult your own interests, you would send us a model of your machine, and have it illustrated in our columns. The invention is a good one, and would sell, if properly exposed to the public. At the rate we offer to get up the engravings for you, and insert them in our columns, thirty persons would read an account of your invention at the cost of only one cent to you. In other words, it will cost only $10 to place it before at least 30,000 readers, two-thirds of whom are personally interested in such improvements as you patent covers.

J. W., of R. I.—There is no other work on rifles known to us besides Chapman's. We believe you can procure it of Appleton & Co., of this city.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, October 31, 1857:—

P. & C., of Ohio, $25; L. A. C. B., of Ill., $25; A. H., of N. Y., $25; C. & M., of Vt., $20; G. & R., of Ill., $37; S. B. D., of Ohio, $25; H. T. S., of R. I., $30; A. J. C., of Mass., $20; W. M., of Ky., $50; R. & H., of Ill., $30; J. C., of S. C., $37; W. & W., of N. Y., $42; G. C., of N. Y., $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 31, 1857:

A. H., of N. Y.; R. & M., of N. Y.; L. A. C. B., of Ill.; P. & C., of Ohio; W. M., of N. Y.; C. & M., of Vt.; G. & R., of Ill.; E. K. G., of Mass.; J. H., of Ill.; T. M. S., of Ga.; S. B. D., of Ohio; W. C. W., of N. Y.; G. C., of N. Y.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the modes of proceeding at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office. Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. Our branch offices are corner of F and seventh streets, Washington, D. C.; No. 66 Chancery Lane, London; 29 Boulevard Saint Martin, Paris, and 2 Rue Therezienne, Brussels. Circulars of information concerning the present course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, etc., may be had gratis upon application to the principal office, or either of the branches. Communications and remittances should be addressed to

MUNN & CO.,
No. 128 Fulton st., New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly,
CHAS. MASON.
August 14, 1857.

AMERICAN INSTITUTE LIBRARY.—THE SUPPLEMENTARY CATALOGUE is now ready, and may be obtained by members, gratis. The Library contains upwards of 8,000 volumes, embracing works in all the various departments of art, science, and literature, and is rapidly increasing, particularly in useful and practical works. The following have recently been added, viz.:—

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Mone's American Engineering, (embracing riverboat, marine, locomotive and stationary engines,) folio, New York, 1854.

Clark's Railway Machinery; 2 vols., quarto, London, 1855.

Truran on Iron Manufacture; quarto. London, 1855.
Buchanan on Mill-work, &c.; 2 vols., folio. Plates.
Tomlinson's Encyclopedia of the Useful Arts.
London's Encyclopedia of Agriculture.
London's Encyclopedia of Gardening.
Mechanic's Book of the Garden.
Nott & Glidden's Indigenous Races of the Earth.
Vaux's Villas and Cottages.
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Sand Lake, Rensselaer Co., N. Y., Oct. 28, 1857.

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Science and Art.

Planetary Discoveries.

M. Goldschmidt, of Paris, who has recently discovered several small planets, a few nights since surpassed all former astronomical observers, by discovering two planets in the same evening, and that with an instrument of very moderate power. This success has certainly never been paralleled.

Russian Leather.

None of the European or American artizans in leather have yet been able to produce an article equal in quality to that which is sent forth from the Russian workshops. Its power of resisting decay in damp situations, and its freedom from the attacks of insects and fungi, are remarkable. It is prepared by tanning the skins of calves, sheep, and goats with a warm decoction of willow bark; the red dye is communicated by a decoction of red sanders wood, and afterward applying by a kind of currying process on empyreumatic oil obtained by distillation from the bark of the birch tree, which gives it its agreeable odor. The hair is said to be loosened by a weak wood-ash lye, of which the active principle is carbonate of potash. The process of manipulation, as carried on in Russia, produces an inferior quality when practiced in other countries.

Artificially-Reared Fish.

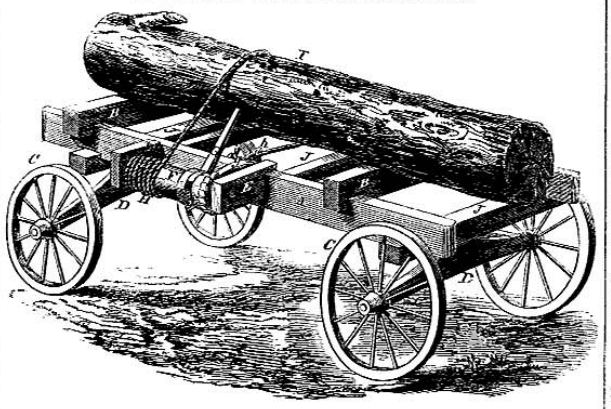
At an exhibition in the Champs Elysees, Paris, were about three thousand fish from the Artificial Pisciultural Establishment formed at Thuringen by the French government. They consisted of salmon from the Danube, trout from the lakes of Switzerland, and grayling from the Lake of Constance. The last named have only been hatched the last Spring. There are two salmon three years old, one of which is nearly nineteen inches long by thirteen inches in circumference. These fish were conveyed in cylindrical reservoirs made of tin, the water being renewed frequently. If, instead of breeding and rearing these fishes, they had been permitted to return to the ocean, or to remain in their native streams, they would have exhibited very different results. A young salmon of four inches in length, and as many ounces in weight, when permitted to proceed to the ocean, returns to the rivers in about six weeks, from five to eight pounds' weight. Left to nature, the salmon will grow to about twenty-five pounds in three years; reared and fed at the pisciultural establishment at Thuringen, he will not in the same time reached a weight of five pounds. So that, after all, Dame Nature has the best of us, and will continue to do so in this particular, as it would seem, from all evidence, that we cannot adopt any but the natural method of producing living beings, and the artically-reared fish will prove like machine-hatched hens—but weak and sickly substitutes for the natural ones.

One of the Fairy Tales of Science.

If I were a poet I might describe cobalt as it deserves to be described; but being only a chemist, I must state in plain prose that the history of cobalt is of so strange a character, that one can scarcely believe it to be a reality. The very name "cobalt" is derived from *kobold*, which means an "evil spirit;" yet although it retains its name, it is now placed on a pinnacle of fame in the chemical laboratory, and very justly so, for its intrinsic worth is great. For many years cobalt was found in such great abundance in the mines in Saxony, that it was neglected and thrown aside as useless. In some of the copper mines (according to Parkes) it was so abundant that "a prayer was offered to God in the German churches, that He would preserve the miners from cobalt (*kobolds*) and other spirits." At that time the true use of cobalt and its value in the arts was unknown. In latter years, however, there has been a wonderful advancement in chemical science; so that cobalt, among other materials, has been rescued from the wasteful hands of ignorance, and it is now considered to be one of the most useful of natural productions. Cobalt is a very brittle metal, and of a reddish gray color, like a mixture of copper and iron. In the metallic state, cobalt is exceedingly difficult to prepare; but the oxyd or rust of the metal is easily produced; and it is the beautiful color of this rust, and the exquisite tint, varying from deep azure to sky-blue, which it has the power of imparting to porcelain and pottery, that renders it so valuable. All blue glass is so colored by cobalt-oxyd. There are also several colors used by painters and artists, such as *zaffre* and *smalt* and artificial *ultramarine*, which owe their charming effect to cobalt.

As if to invest this curious metal with some spiritual qualities, cobalt can be made into ink which, although quite invisible when used, instantly appears to the reader when the paper is warmed before a fire, but again becomes invisible as the paper cools. The principal mines of cobalt are in Saxony, Hesse, and in the Mendip Hills in Somersetshire. It is asserted that the profit derived from the Hesse mines alone is equal to $100,000 per annum. So much for *kobolds* and other evil spirits!

GILBERT'S TIMBER CARRIAGE.



This carriage is intended for taking up logs from the forest or lumber-yard, and, by the apparatus connected with it, large pieces of timber are easily raised on to it. By reference to the engraving, the whole device will be appreciated.

A is the frame of the wagon, mounted on axles, D, and wheels, C; the sides of the frame are held together by the cross pieces, J, and the log rests on the cross bars, B. Two pieces, E E, extend from the sides, and between them is the windlass, F, having a handle or lever, G, and a ratchet, *f*, and pawl, *g*; round the windlass is wound the rope, H, one end of which is attached by a hook, *h*, to the eye, *i*.

The operation is as follows:—Two skids are placed from the wagon to the ground in an inclined position; the log, I, is rolled up to them, and the rope passed round the log; the hook is then fastened in the ring, and the windlass turned, which brings up the log. It is easy to move the windlass from side to side as occasion may require. The whole is very simple, and of some utility.

It was invented by P. Gilbert, of Alexandria, Ohio, and was patented September 15, 1857. All further particulars and information may be obtained from the inventor.

Different Varieties of Marble.

The term "marble" is applied to those finer varieties of granular and compact limestone, which, being of a closer grain are susceptible of a superior polish, and are remarkable for either their whiteness, their blackness, or the beauty and variety of their colors. In former times, the term "marble" was indiscriminately applied to many stones that admit of being polished, such as albaster, serpentine, basalt, porphyry, &c. At the present day, however, it is customary to recognize as marbles only the kinds of limestone above mentioned, whether in a pure state or varied with foreign substances mixed with, or imbedded in, the mass—such as serpentine, hornblende, quartz, &c. Where a piece of marble is not purely white, it has received its tints generally from the oxyd of iron, the solution of which has wholly or partially penetrated the mass previous to its complete induration. Blue and green marble frequently owe their tints to minute particles of hornblende. The black varieties are colored by carbon, and sometimes by bitumen. The favorite material of both the artists of ancient Greece and modern Europe is the Carrara, in consequence of its purity of color, its delicate transparency, and its granular texture, which renders it much more easy to work than compact limestone. The Parian marble is the most pure, consisting almost entirely of carbonate of lime, and is, consequently, softer, somewhat more transparent, and of a more visible laminated texture than that of Carrara; the latter has, however, no other rival as regards quality and durability. The quarries of Carrara are inexhaustible, and contain four varieties of marble, of which the most valuable is that used by sculptors—the white, granularly foliated limestone. The statuary marbles are principally exported to France and England. Russia, whose rigorous climate peculiarly demands building material able to resist its ungenial atmosphere, erects with the world-famed marbles of Carrara her majestic palaces and churches.—*Boston Courier.*

Paving-Stones.

How seldom does the street passenger think that each of those round boulder stones has its own particular history, almost as important as his own, and ranging through the whole and mighty Past; and yet it is so, and the history of one of these paving-stones shall form our theme. In the far back chaotic age that stone was created, and then when the ordering came, and each material found and took its place, it was assimilated with some hard and mighty rock, when, either by the action of the waves upon some geological sea-shore, or by the action of the winds and rain upon some mountain which it formed, it was broken off; then, carried across the bed of the sea by currents or rolled down the valleys by glaciers, it became rounded in the journey, and was deposited in a bed of sand. The sea-shore, in course of time, has become dry land; the valley has been elevated; other changes have gone on; and now, miles away from where the seas of to-day beat their waves against the shore, or regions of eternal snow prevail, we quarry these stones for various uses, and with these boulders pave our streets. Their history is wonderful; who shall say what changes they have yet to undergo?

Extensive Manufactory.

The largest single manufacturing establishment in the world is now in operation at Saltaire, England, for the manufacture of cloth from the wool or hair of the Alpaca goat. The vastness of this great work will be seen from the following statement, which applies to only one department. The weaving shed contains 1,200 looms; the length of the shafting is nearly ten miles, and weighs between six and seven hundred tuns; the steam engines, to work these shafts, are equal to 1,250 horse power; and the looms in one apartment are capable of weaving 30,000 yards, or nearly eighteen miles of alpaca cloth every day, and an aggregate length of 5,688 miles of cloth annually. The building covers six acres of ground. The workmen and their families all live in the village adjoining. The whole of this establishment is the property of a single enterprising capitalist, Titus Salt, Esq., from whom the village derives its name.

Literary Notices.

HANDBOOK OF HOUSEHOLD SCIENCE.—By Edward L. Youmans. New York: D. Appleton & Co. This work is a kind of encyclopædia of all those little pieces of information that every one wants to know. In it will be found many useful suggestions as to health, cleanliness, diet, sight, &c., and a great amount of knowledge on cooking, considered in a scientific light. Should any one want a book pleasantly written, arranged in a easy style for reading, illustrated with good cuts, from which they may always obtain some interesting facts, we advise them to procure this work, it being one of the best of its class.

BLACKWOOD'S EDINBURGH MAGAZINE.—This favorite monthly for October, just re-published by Leonard Scott & Co., No. 54 Gold street, this city, has two capital articles on "Our Hagiology," and "Beloochee Traits" and "What will he do with it" still maintains the interest which its author can always command.

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